bp

Overnight

August 3, 2012

BP Products North America Inc.
2815 Indianapolis Blvd.
P O Box 710
Whiting, IN 46394-0710

Mr. Paul Higginbotham
Indiana Department of Environmental Management
Office of Water Quality – Permits Branch
100 N. Senate Avenue
Mail Code 65-42
Indianapolis, IN 46204-2251

Subject: Final Filter BP Whiting Business Unit Notice of installation for additional pollution control equipment and design summary of modifications to the WWTP

Dear Mr. Higginbotham:

Per our NPDES Permit No IN0000108 Part II General Condition number (15), BP Whiting Business Unit is submitting a notice of installation and design summary changes for our Waste Water Treatment Plant (WWTP) operations. Please find enclosed an updated process flow diagram for the newly installed final filters, F210 and F211. These two open top sand and anthracite final filters have four cells in each unit and have replaced the previous eight multimedia enclosed bullet filters. They began operation on July 24, 2012. This diagram replaces attachment 4 dated 21 Dec 2011 of the NPDES permit application supplemental material. Please also find enclosed plot plans, PFD, and an excerpt from our design basis document which details the filter size, design and configuration.

The final filters are one of several upgrades that were planned and previously discussed with your department. Previous notices to your office were given regarding the diffuser start up in 2010 and Tank 5052 start up in 2009. Brine Treatment units are scheduled to be operating in 2013 and notice will be given to your office at that time.

Please contact Rose Herrera (219) 473-3393 if you have any questions regarding this notice.

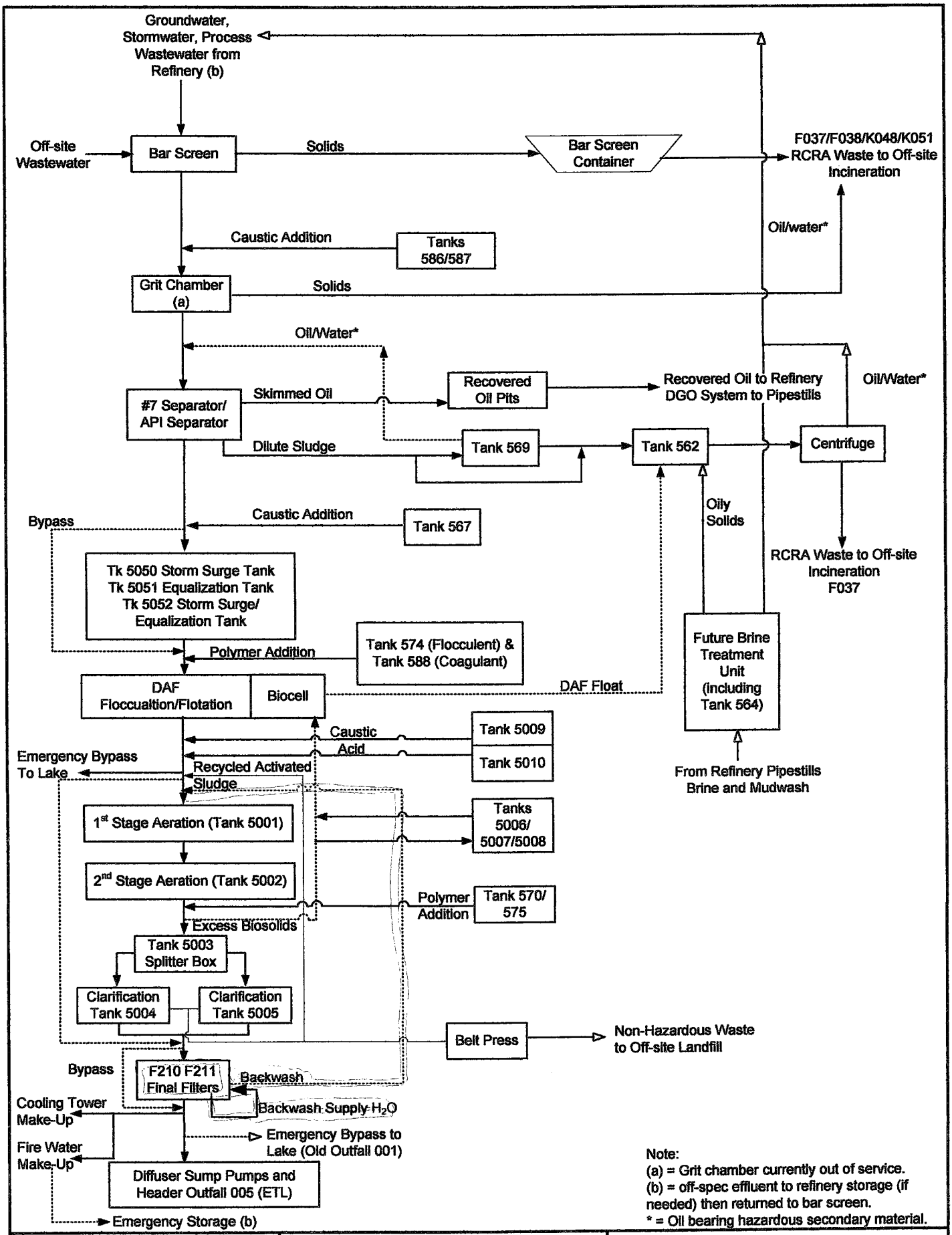
Sincerely,

Linda Wilson

Linda J. Wilson
Environmental Superintendent
Whiting Business Unit

Attachments

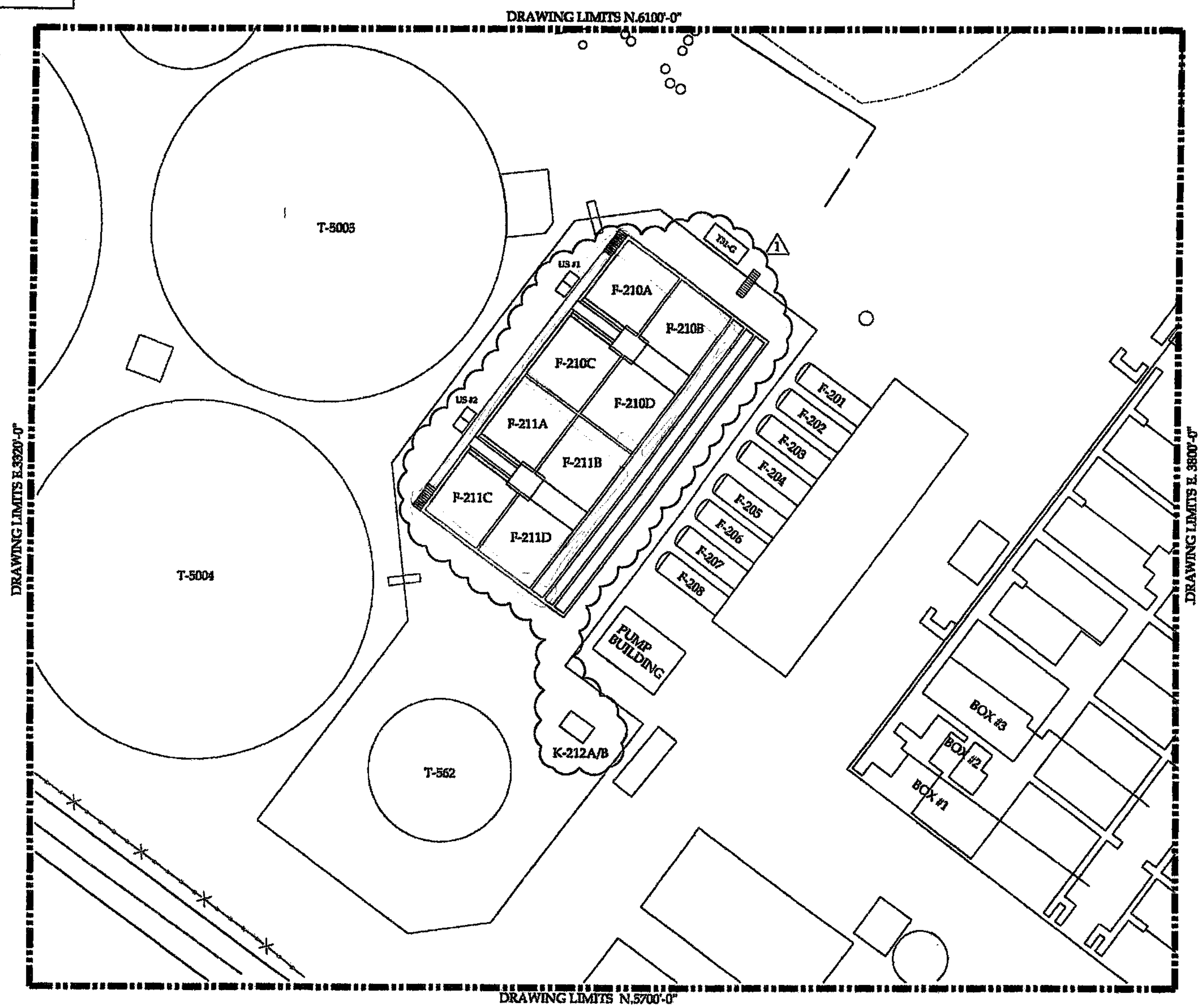
Copy: Steve Roush, IDEM Office of Water Quality Permits Branch.



Note:
(a) = Grit chamber currently out of service.
(b) = off-spec effluent to refinery storage (if needed) then returned to bar screen.
* = Oil bearing hazardous secondary material.

Prepared for:	Prepared by:	ATTACHMENT 4. Lakefront WWTP Process Diagram
bp Whiting, Indiana	ENVIRON	20-24994A 17Jul12

D-3001-G-01381



EQUIPMENT SCHEDULE

NUMBER	DESCRIPTION
F-210A	FINAL FILTER
F-210B	FINAL FILTER
F-210C	FINAL FILTER
F-210D	FINAL FILTER
F-211A	FINAL FILTER
F-211B	FINAL FILTER
F-211C	FINAL FILTER
F-211D	FINAL FILTER
K-212A	AIR BLOWER
K-212B	AIR BLOWER

0' 10' 20' 40'
SCALE IN FEET

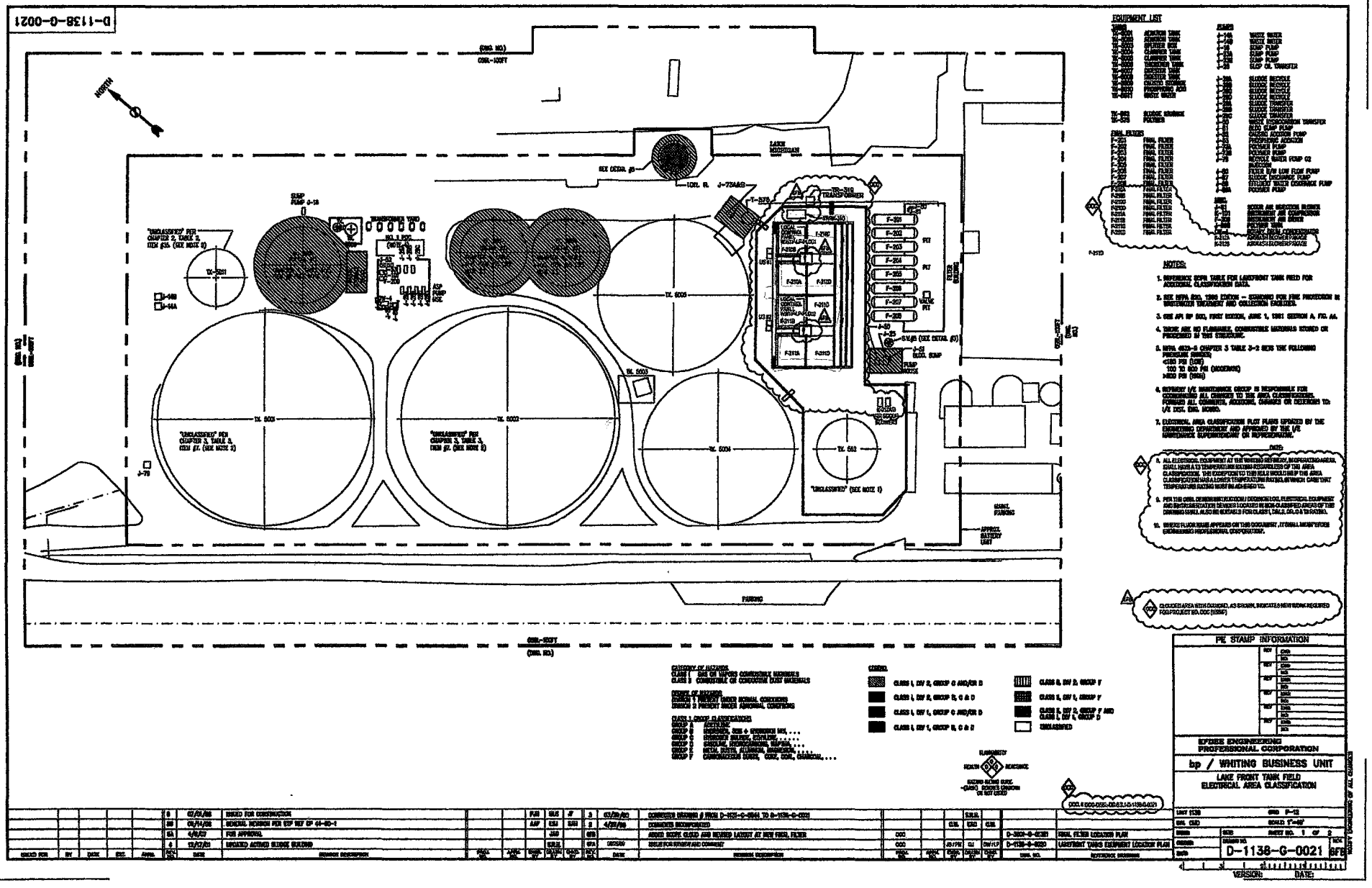
REV NO.	DOCUMENT NO.	REVISION STATE	DATE	BY	REVISION DESCRIPTION	PROJECT ID	CONTRACTOR	CHKD BY	APPR BY
1	OCC-GEBL-DR-3.3-D-3001-G-01381	IFD	7-22-09	JQ	ISSUED FOR DESIGN	B3CX	FLUOR	KJR	RJZ
0	OCC-GEBL-DR-3.3-D-3001-G-01381	IFR-C	9-13-07	JQ	ISSUED FOR REVIEW AND COMMENTS	B3CX	FLUOR	VH	RJZ
A	OCC-GEBL-DR-3.3-D-3001-G-01381	IFI	7/13/07	HH	ISSUED FOR INFORMATION (BASIS OF ESTIMATE)	B3CX	FLUOR	VH	RJZ

FLUOR.

BP PRODUCTS NORTH AMERICA, INC.
WHITING BUSINESS UNIT

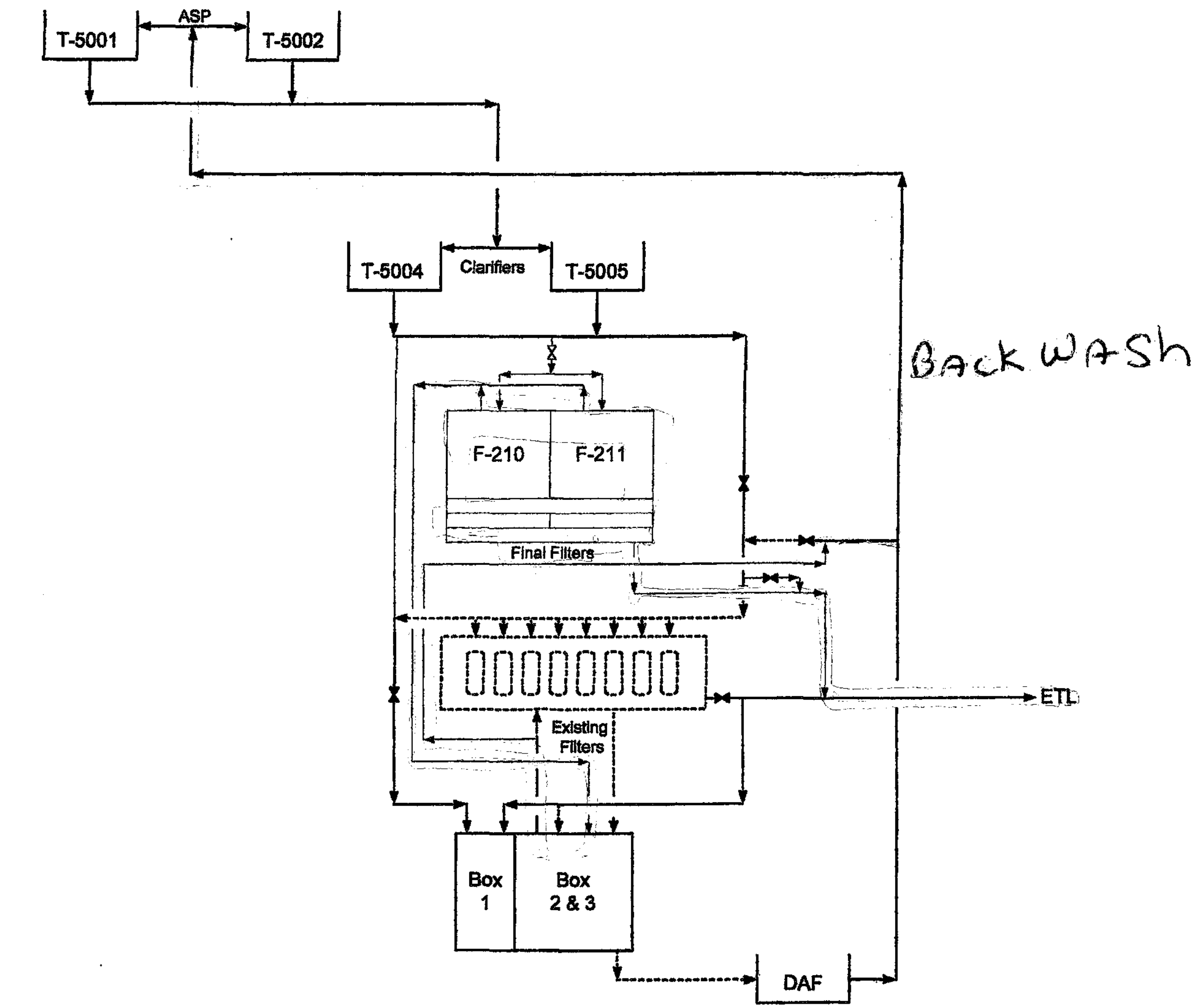
OCC PROJECT
FINAL FILTER
LOCATION PLAN

UNIT: 3001	SCALE: 1" = 20'-0"	STATUS: IFD
DRAWN: EHS	DATE: 5-9-07	SHEET NO. 1 OF 1
CHECKED: RJZ	DRAWING NO. D-3001-G-01381	REV 1
ENGD: VH		



D-1138-SK-00003

NOTES
1. PIPE IS RUN IN PHASE 1, BUT WILL NOT BE CONNECTED UNTIL PHASE 2.



Line Legend

New
Existing
Demoed

FLUOR.

BP PRODUCTS NORTH AMERICA, INC.
WHITING BUSINESS UNIT

OSBL
BLOCK FLOW DIAGRAM
FINAL FILTERS
PHASE 2

UNIT: 1138	SCALE: NONE	STATE: IFD
DRAWN:	DATE: 10/28/09	SHEET NO. 3 OF 3
CHECKED: OSBL	DRAWING NO. D-1138-SK-00003	REV. 2
ENGR: MH		

VERSION: DATE:

REV NO.	DOCUMENT NO.	REVISION STATE	DATE	BY	REVISION DESCRIPTION	PROJECT ID	CONTRACTOR	ENGR BY	APPR BY
2	000-OSBL-DR-6.1.3-D-1138-SK-00003	IFC	04/21/10	CF	ISSUED FOR DESIGN	WRMP		MH	
1	000-OSBL-DR-6.1.3-D-1138-SK-00003	IFD	10/23/09	MH	ISSUED FOR DESIGN	WRMP		MH	

NOTIFY INFORMATION MANAGEMENT OF ALL CHANGES

WWTP Final Filters Design Basis

3. Design Basis

Flow to the DAF based on data from 2003 through March 31, 2009 is as follows:

Daily Average = 19.6 MGD
Daily Max = 24.6 MGD
Instantaneous Max = 40 MGD

The Final Filters are designed per the basis given in the select stage and approved in the define stage:

New Filters (F-210 A/B/C/D and F-211 A/B/C/D)

Filter Capacity:	32.1 MGD of water (system design capacity)
Type:	Gravity Mono/Multimedia Filters
TSS In:	30-50 ppm typical, 1,000 ppm maximum upset condition
TSS Out:	<5 ppm
Surface Loading:	3.44 gpm/ft^2 (all cells in service), 3.93 gpm/ft^2 (7 cells in service)
Backwash Rate:	12 gpm/ft^2
Temperature:	65 - 105°F
Blowers:	Two (2) rotary lobe blowers, 3248 SCFM, 1775 rpm, 125 hp each
Service Run:	24 hours

4. Design Considerations

The current design of the Final Filters causes a whole cluster to be shut down to do any maintenance on an individual filter cell. A variance can be sought against the refinery LOTO procedure so that an individual filter cell can be isolated, as opposed to the whole cluster, to prevent such a large impact on operations during maintenance. The current design reduces their backwash capacity by 50% during any cell maintenance. Additionally, to help alleviate backwash capacity concerns during maintenance outages, water may be stored in the Stormwater/equalization tanks.

The existing filters are housed in a building. However, for the new final filters, though some concerns on winterization have been discussed, BP project management decided to move forward without adding a roof or cover during the engineering phase. If BP project management determines the need to add a cover or shed for winterization, it will be done during the construction phase.

A cover for keeping debris out of the effluent chamber will not be designed during the engineering phase, but will be specified out and installed during the construction phase by field engineering.

Existing infrastructure at the WWTP allows for the backwash of only one filter cell at a time, the design capacity of 32.1 MGD must be maintained while one filter cell is in backwash mode.

One connection is included that can be used for future injection of biocide and/or other chemicals to help aid in the preventive maintenance efforts of final filters, if needed.

CALCULATIONS

FOR

CenTROL® Filter Data Sheet

FLUOR CORP C/O FLUOR ENTERPRISES, INC.
TO BE COMPLETED BY SUPPLIER/CONTRACTOR
PROJECT CONTRACT NO.: 83CX
P.O./CONTRACT NUMBER: 83CX-4-0201-AMB-OSBL-FLD
FIRST ISSUE: YES [ ] NO [X]
SDC CODE (S): DS
ITEM/TAG: F-210A/B/C/D & F-211A/B/C/D NUMBERS:
BP DOCUMENT NO. OCC-OSBL-30-DS-SWT-00002
FLUOR CORP CONTROL NUMBER (First Issue by Fluor Corp): 5
FLUOR CORP TO COMPLETE:
DATE RECEIVED: 20-AUG-09 — REV. 3A
AUTHORIZED BY:
[X] A - Proceed
[ ] B - Proceed, change as noted and resubmit
[ ] C - DO NOT PROCEED, change as noted and resubmit
[ ] D - Reviewed for Information Only
[ ] G - Quality is below standards. Correct and resubmit.
Authorization to proceed does not relieve contractor/vendor of its responsibility or liability under the contract/purchase order

AH
2-18-11

REV	DESCRIPTION	DATE	DES	CHK	APP	ICE
1	Corrections per returned submittal	8/4/09	BLB			

DESIGNER: BLB — DATE: 1/30/09	TITLE: CONCRETE CenTROL GRAVITY FILTER FILTER DATA SHEET BP OCC – WHITING, IN
CHECKER — DATE	CLIENT: FLUOR ENTERPRISES, INC – 83CX-4-0201-AMB-OSBL AMBITECH
ENGINEER — DATE	SIEMENS — Water Technologies, Ames, IA, (515) 268-8400
MANAGER — DATE	
FILE:	PROJECT: 101007 — CODE — DRAWING: 1030774139 — SHEET: 1 OF 3 — REV: 1
SCALE:	

5-3A

SIEMENS

Water Technologies
Ames, IA
(515) 268-8400

Filter Data Sheet

				Rev
DATE: 8/4/09	REV. NO. 1		INQUIRY/PO NO B3CX-4-0201-OSBL-RQ	
CONTRACT: B3CX	INQUIRY NO.:		ITEM NO.: F-210 A/B/C/D; F-211 A/B/C/D	
EQUIPMENT NO: F-210 A/B/C/D; F-211 A/B/C/D			SERVICE: Final Filters	
NO. OF FILTERS REQUIRED: 2	NO. OF CELLS PER FILTER: 4		NO. OF CELLS OPERATING : 8	
NO SPARE: 1 (in Backwash)	TYPE ELEMENT (TUBULAR-CLEANABLE), OR OTHER: Gravity Flow			
REFER TO SPECIFICATION NO.: 07232-01-5252-001			REFER TO DRAWING NO.:	
ENGR APVL.:	DATE:	CLIENT APVL.:	DATE:	

Notes

See Notes Below

Process Design

Name Fluid Filtered		2° Clarifier Effluent Wastewater
Quantity Fluid Filtered (Total)	# / HR	11,247,433 (32.358 MGD)
Operating Pressure	psig	ATM
Operating Temperature	°F	60
Specific Gravity at Operating Temperature		1
Viscosity at Operating Temperature	Cp	1.1344
Allowable Pressure Drop	psi	[ ] Clean 0.51 [ ] Dirty 2.2
Name of Particles Removed		Clarifier Effluent Carryover
Maximum Particle Size	Microns	---
Minimum Particle Size	Microns	---
Size of Particle Removed	Microns	20 and Larger
Quantity of Particles to be Removed	# / HR	390.7 Based on 3 mg/l effluent conc
Name Backwash Fluid		Filter Effluent
Quantity Backwash Fluid (Total)	# / HR	9720 gpm with air
Operating Backwash Pressure	psig	5psig Air 1psig Water
Operating Backwash Temperature	°F	60

Mechanical Design

Housing Design Pressure [ ] psig Design Temperature 60 °F Corrosion Allowance NA in.
CODES: ASME [ ] Yes X No Stamp [ ] Yes X No Others _____
Element Minimum Burst Strength [ ] psid

REV.	ISSUE STATUS	DATE	BY	CHK'D	APP'D

SIEMENS

Water Technologies
Ames, IA
(515) 268-8400

Filter Data Sheet

Materials Of Construction		* Connections	No.	Size	Rating	Rev
Filter Housing	Concrete	Inlet Flume	2	52"W x 44" D	NA	
Filter Housing Cover	N/A	Distributor Inlet	8	18"	NA	
Filter Housing Supports	Concrete	Scour Air Inlet	8	12"	NA	
Inlet Flume	Concrete	Filter Outlet / Backwash Inlet	8	36"	NA	
Filter Cell Supports	Monolithic					
Filter Cells	Monolithic	Backwash Outlet	8	24"	NA	
Gaskets		Instruments				
		* All connections 2 inches and larger shall be flanged.				

Type of Operation [ ] Manual [X] Automatic Local Control Panel by Supplier [X] Yes [ ] No

Electricity: Control [X] AC or [ ] DC [ ] V [ ] Phase [ ] Hz
Power [X] AC or [ ] DC [ ] V [ ] Phase [ ] Hz

Area Classification: Class: 1 Group: C,D Division: 2

Pipe, valves, and fittings supplied to be in accordance with: Per Project Specification

Instruments supplied with Filter to be as follows: (8) Filter Level Transmitters

Low Voltage: 480V, 3 Phase, 60hz; Control Power: 120V, 1 Phase, Temp Rating T3

Data By Supplier

Manufacturer: Siemens Water Technologies Type: CenTROL® Gravity Filter

Filters Required 2 Cells Per Filter 4 Total No of Filter Cells 8

Cell L x W x H: ft. 30 x 27 x 18.1 Surface per Cell 810 FT² Surface Area of All Cells 6480 Sq Ft

Clean Pressure Drop 0.51 Psi

Shipping Dimensions Shipping Weight: Est. 9,010,000 lbs (2 Filters)

Additional Requirements

1) TSS incoming is in the range of 30-50ppm	
2) TSS out to be 5ppm	
3) Filters to have 24 hr service run between backwashing	
4) Loss of filter media to be less than 2"	
5) Backwash rate for one cell at a time is 9720gpm with air	1
6) Filters shall include initial charge of filtering media	
7) Gravity head available at effluent weir is at EL 16.52'	
8) Surface loading of 3.47 gpm/sqft when all cells are in service and 3.96 gpm/sqft when one cell is in backwash mode	1